hundred new inscriptions. He is about to depart to determine the position of the mountain mass of Jebel Agée, and proposes to traverse the entire Hedjaz. The results of his first journey are in preparation for publication by the Geographical Society of Paris.

The Aral.—M. Konshin states as the result of his explorations that the immense depression of Sara-kamysh, in some places 280 feet below the Aral, formed in a geologically recent time one basin with that lake. The fossils of this depression are identical with species found in the Aral and Caspian lakes and show that its waters were brackish or salt. The lake had an outflow into the Caspian.

China.—M. Hosie, who has made a journey of nearly 2000 miles from Chung-King in Szo-chuan to Cheng-tu, capital of that province, and thence by Tali in Yunnan to Yunnan-Fu, returning by another route, states that the European maps of these districts are exceedingly defective, although fairly good native maps can be procured.

GEOLOGY AND PALÆONTOLOGY.

The Protoconch of Cephalopoda.—The accepted divisions of the Cephalopods have been founded by authors wholly upon characteristics of the adult form of the shell, whether straight, as in Orthoceras, curved, as in Cyrtoceras, coiled up with open whorls, as in Gyroceras, or with the whorls in contact, as in Nautilus. These modifications, together with the outlines of the aperture and other minor characteristics, have, heretofore, determined the group to which any given shell was referred.

The examination of the young of all the closely coiled Nautiloidea shows them to be as a rule uncoiled, and in the earliest stages simply arcuate as in the adults of the group of the Cyrtoceratites, and having a scar on the apex which represents the beginning of the stage in which the animal commences to construct the true or secondary shell. The young of all the Ammonoids have, on the contrary, with the marked exception of some palæozoic species and some *varieties of species*, closely coiled whorls at the corresponding stage of growth, and upon the apex is a tiny bag or embryo shell, which has been very appropriately called the protoconch by Owen.

In my Embryology of Cephalopods, Bulletin of Museum of Comparative Zoölogy, Cambridge, No. 5, Vol. III, the position was taken that the scar of the Nautiloidea showed that a protoconch had existed in the embryo of Nautilus, but had disappeared during the growth of the shell, the scar being uncovered by its removal. This supposition was endorsed by Professor Richard Owen, but rejected by Barrande, who insisted that the general absence of a protoconch was a fatal objection. There exists, however, on the apex of some Orthoceratites, an excrescence or

bulb of a withered and somewhat irregular and variable shape. De Koninck, in his magnificent work upon the "Calcaire Carbonifere de Belgique," curiously enough cites these very forms as the principal proofs against my conclusion, because in them the scar is absent. According to my examinations and drawings, however, the scar ought to be found in such examples underneath the bulb of the apparently complete apex, which is simply the withered and shrunken remains of the primitive protoconch. This was evidently originally a soft, embryonic shell, composed of conchiolin, and not of calcareous matter as in the Ammonoidea. I have seen and figured several examples in which a bulb was present on the apex and no scar visible, and one case in which the bulb (protoconch), had evidently been taken away, leaving the scar visible below, surrounded by the broken edges of the outermost shell layer, which formerly connected the apex with, and covered the protoconch. The external layer of shell and its longitudinal ridges from the apex up, on to the so-called plug of the cicatrix described by Barrande, have also been traced, and thus every point in the evidence appears to be complete, and the fact that the bulb is covered by a true protoconch continuous with the shell of the apex seems to be established.—*Alpheus Hyatt.*

Fossil Man in Mexico.—Dr. Mariano Barcena, director of the department of Geology and Palæontology of the National Museum of Mexico, recently discovered the facial and mandibular parts of a human skull in a hard rock not far from the city of Mexico. The specimen was found in a hard siliceous limestone near the border of Lake Texcoco, at some elevation above the level of the water of the lake. Overlying the bed of limestone, is a lacustrine deposit, which is similar to that made by the present lake, and contains the same mollusca, etc. Whether the limestone be a still more ancient deposit of the lake, has not yet been determined by Dr. Barcena, but the overlying deposit indicates the former wider extension of its waters. It is also evident that since the entombment of the human skull, both deposits have been elevated several feet, and separated from the part now under the lake by a fault. This was probably accomplished at the time of the projection of an eruptive hill near the locality. Dr. Barcena, from whom the above statements are derived, will shortly describe the characters of this interesting specimen.

Geology of Algiers.—*Tertiary.*—The three tertiary stages, say M. Peron, can usually be easily distinguished in Algiers, for they present themselves in isolated and independent masses. The systems of upheaval of the Pyrenees of Corsica and Sardinia, and of the western Alps, have all played an important part in Algiers, and have so separated the tertiary areas as to render their classification relatively easy. The eocene is in many places absolutely without fossils, and in most others offers nothing to the palæon-

tologist but immense numbers of nummulites. Sandstone is the chief constituent, but there are thick bands of claystones, flint, gypsum, etc. The total thickness cannot be less than 400 meters. This formation is the most important factor in the mountains of the Tell, and a multitude of summits are composed of the sandstones and nummulitic limestones. It is superposed on various formations, and is usually highly unconformable with the stratum on which it rests. The eocene appears in two interrupted belts parallel to the coast, one in the Tell, the second in the north of the high plateaux. It does not occur in the south, and is more developed in the east than in the west. The miocene, on the contrary, is most developed in the west, and, though frequently composed of rocks very similar to the eocene, can usually be distinguished by its highly fossiliferous character. In the department of Constantine part of the deposits are lacustrine or fluviatile. Miocene strata occupy large areas in the Tell, apparently filling depressions produced after the deposit of the eocene, and in the province of Oran they reach their highest development, and are rich in fossil echini.

The area occupied by the pliocene is much more limited, and is composed of some isolated lacustrine deposits in the province of Constantine, with perhaps certain belts in the Saharian region, and of small enclosed patches of marine origin filling depressions near the coast. The quaternary covers enormous areas, and belongs to different epochs. The strata are terraced in the valleys hollowed out during the quaternary period, or fill the great depressions of the high plateaux and of the Sahara. These are of lacustrine, fluviatile or continental origin, but marine beds occur in many spots along the coast from Tripoli to Morocco. The great superficial development of these beds in the plateaux and the Sahara, and the thickness they attain in the depressions, cause some to refer them to the upper tertiary, and some to believe them to be the work of a gradually drying-up interior sea. Several of the characteristic mammals have been found, but it cannot be said that these beds have been thoroughly explored.

THE CARBONIFEROUS FLORA OF RHODE ISLAND.—The following is a list, with descriptions of two new species, of such of the fossil Carboniferous plants of Rhode Island as are contained in the Museum of Brown University, Providence, R. I., and which have been sent me for identification, and of those which I have had opportunities to see in different collections, especially that of the Museum of Comp. Zoöl. of Cambridge, and of Mr. R. D. Lacoe of Pittston. Those from Valley Falls, R. I., have in part been collected by Mr. Thomas Battey, and those from Rhode Island, near Portsmouth, were collected by J. H. Clarke, Esq. A few species have been collected at Cranston, R. I., by Professor A. S. Packard.

A few species from the Rhode Island coal series were enumerated and figured by Dr. C. T. Jackson in his Report on the Geology of Rhode Island, published in 1840. A few others have been figured by Professor Teschemacher, in Boston Journ. Soc. N. H., Vol. v, Pl. XXXIV. The others are described and mostly figured in the U. S. Coal flora, Report P, of the second Geological Survey of Pennsylvania.

The following list embraces eighty-eight species, of which fifty-six are ferns:

FILICACEÆ.

Sphenopteris fuciformis, sp. nov.—Frond polypinnate; pinnæ linear or narrowly lanceolate, bipinnatifid; pinnules alternate, oblong, pinnately divided into simple, linear, obtuse or inflated at apex, open or reflexed segments.

The whole plant apparently originally soft, is deformed by compression. The main rachis is flat, smooth, like all the parts of the plant, 2^{mm} broad; that of the lateral pinnæ is half as broad; that of the pinnules a little more than $\frac{1}{2}^{mm}$ in diameter; the laciniæ 3^{mm} long, $\frac{1}{2}^{mm}$ broad or a little more, are open and somewhat curved back, all simple and entire.

This species closely resembles *Sphenopteris laxa* St., Fl. d. Vorw. I, Pl. 31, fig. 3, described in II, p. 58; and also *S. elegans* Brgt., differing essentially in the laciniæ alternate, simple not bifid nor forked at the apex.

Sphenopteris pseudo-murrayana Lesq.—Upper part of pinna.
Sphenopteris gravenhorstii Brgt.
Sphenopteris chærophylloides Brgt.
Sphenopteris cristata St.
Sphenopteris elegans Brgt.
Sphenopteris hœninghausii Brgt.
Sphenopteris tridactyuites Brgt.
Neuropteris cordata Brgt.

Neuropteris hirsuta Lesq.—With a Cyclopteris, round or reniform large leaflet, and also small round basilar ones; all detached from the rachis and representing the same species.

Neuropteris agassizii Lesq.
Neuropteris crenulata ? Brgt.
Neuropteris desorii Lesq.
Neuropteris germari Goepp.
Neuropteris heterophylla Brgt.
Neuropteris tenuifolia Brgt.
Cyclopteris species.
Dictyopteris scheuchzeri Hoffm.—As figured by Roehl.

Callipteridium sp. nov. ? or variety of *Alethopteris urophylla* Brgt.—Main rachis somewhat large, 3–4^{mm} in diameter; ultimate pinnæ very long, close, narrow, nearly at right angles; parallel; pinnules slightly inclined upward, or open, subopposite, separated to the base, connate at the base only, oblong-lanceolate, obtuse or blunt pointed, gradually narrowing from the base upward; middle nerve inflated in the lower part, effaced above the middle or under the apex; lateral veins oblique, somewhat curved back, forking once. The pinnæ are very long, the longest preserved is nearly 12^{mm} long, broken like all the others below the apex so that no ultimate pinnule is observable; they are comparatively narrow, 15^{mm} at base; only 5^{mm} at the point where they are broken; the veins are not very distinct, divided like those of *Alethopteris urophylla* Brgt., which the species resembles in the form of the pinnules. As the ultimate pinnule, which in the European species is very long and linear lanceolate, is not observable, the identification is not possible. The difference is marked in the narrower pinnæ, the more pointed pinnules and the coriaceous texture.

Odontopteris alpina Gein.—Large leaflets.
Odontopteris alata Lesq.
Odontopteris brardii Brgt.
Odontopteris deformata Lesq.
Odontopteris neuropteroides Newby.
Odontopteris patens Lesq.
Pecopteris polymorpha Brgt.
Pecopteris acuta Brgt.
Pecopteris abbreviata Brgt.
Pecopteris cyathea Bgt.
Pecopteris miltoni Brgt.
Pecopteris oreopteridis Schlt.
Pecopteris candolliana Brgt.
Pecopteris dentata Brgt.
Pecopteris arborescens Brgt.
Pecopteris aspidioides Brgt.
Pecopteris clarkii Lesq.
Pecopteris erosa Gutb.

Pecopteris pennæformis Brgt.
Pecopteris platyrachis Brgt.
Pecopteris quadratifolia Lesq.
Pecopteris (*Goniopteris*) *unita* Brgt.
Pecopteris (*Goniopteris*) *arguta* Brgt.
Pseudopecopteris cordato-ovata (Weiss.) Lesq.
Pseudopecopteris nervosa (Brgt.) Lesq.
Pseudopecopteris dimorpha Lesq.
Pseudopecopteris pluckneti (Brgt.) Lesq.
Pseudopecopteris anceps Lesq.
Pseudopecopteris muricata (Brgt.) Lesq.
Pseudopecopteris spinulosa Lesq.
Rhacophyllum affine Lesq.
Rhacophyllum clarkii Lesq.
Rhacophyllum filiforme Gutb.
Rhacophyllum filiciforme Gutb.
Rhacophyllum fimbriatum Lesq.
Rhacophyllum hirsutum var. *affine* Lesq.
Rhachiopteris sp.—Rachis of fern.

CALAMARIEÆ.

Calamites suckowii Brgt., var. *nodosus* St.—A fine specimen.
Calamites approximatus Schloth.—A twisted fragment.
Calamites ramosus Brgt. — Crushed branches.
Calamites cistii Brgt.
Asterophyllites sublævis Lesq
Asterophyllites equisetiformis Brgt.
Asterophyllites grandis St.
Asterophyllites rigidus Gein.
Annularia longifolia Brgt.—A large form.
Annularia calamitoides Schp.
Annularia inflata Lesq.
Annularia sphenophylloides Brgt.
Sphenophyllum oblongifolium Germ.
Sphenophyllum schlotheimii Brgt.
Sphenophyllum emarginatum Brgt.
Sphenophyllum filiculme Lesq.
Sphenophyllum longifolium Germ.

LYCOPODIACEÆ.

Lepidodendron longifolium Brgt.—Tuft of leaves.
Lepidodendron dichotomum St.—Leaves.
Lepidodendron (Bergeria) *quadratum* St
Lepidodendron aculeatum St.
Lepidophyllum lanceolatum Brgt.
Lepidophyllum fallax Lesq.
Lepidophyllum hastatum Lesq.
Lepidophyllum majus Lesq.
Lepidophyllum oblongifolium Lesq.
Lepidophyllum stantoni Lesq.
Lepidophyllum tumidum Lesq.
Stigmaria ficoides St.—Leaves obliquely crossing clay, and specimens of other leaves.

CORDAITEÆ.

Cordaites borassifolius Unger.
Cordaites diversifolius Lesq.

—*Leo Lesquereux.*

GEOLOGICAL NEWS.—*Carboniferous.*—A large and unusually complete example of Megalichthys was recently found near Leeds. The length is three feet eight and one-half inches, but about six inches of the tail is missing. The features of this fossil, Professor Miall states, confirm the opinion long ago expressed by Pander and Huxley as to the near affinity of this fish to Osteolepis and Diplopterus.

Jurassic.—Mr. J. W. Davis (*Ann. & Mag. Nat. His.*, June, 1884) describes *Lissolepis serratus*, a palæoniscid fish, found at Lyme Regis, England. The jaws are very long, the gape wide, clavicles are well-developed and the head is protected by sculptured surface-enameled plates.

Cretaceous.—M. Capellini, in a communication addressed to the Paris Academy of Sciences, shows that, in the Apennines as well as in the Pyrenees, the Inocerami, fuci, and worm tracks of the strata known as "Flysch" are identical with those of the cretaceous rocks of Liguria and Tuscany. He recommends that the term "Flysch" be dropped from geology.——Twenty-two years ago in the scaglia (cretaceous) of Verona, the remains of a great

fossil animal were found. The report spread that it was a fossil man, and the proprietor asked an enormous price for it, until he was at last convinced it was a reptile. It then fell into the hands of Dr. Capellini, who found it to be a tortoise of the Sphargis group.——M. A. Gaudry recently presented to the Paris Academy of Sciences a note upon a new sirenian found in the Paris basin, and named by him *Haliterium chongueti.* It occurs in the *Ostrea cyathula* marls, and must not be confounded with *H. schinzi.*

Trias.—At a recent meeting of the Royal Geological Society Professor Owen described *Rhytidosteus capensis*, a labyrinthodont amphibian from the Trias of the Cape of Good Hope. The specimen consisted of the anterior part of the skull with a portion of the mandible attached.

Tertiary.—E. T. Newton has recently written upon the antelope remains from the newer Pliocene beds of Britain, and has described a gazelle which, though near to *G. bennettii*, he regards as new, and entitles *G. anglica.*

Quaternary.—M. G. Rolland has presented to the Academy of Sciences of Paris a series of objections to the theory of a quaternary Saharian sea. One of these is the absence of any true bed of marine fossils in the recent strata of the Sahara, since *Cardium edule* is rather a brackish-water than a marine species. A second objection is derived from the levels. M. Rolland believes that from the commencement of the tertiary the Sahara formed a continent except in the relatively narrow space in the north-east, occupied by the eocene sea; at the end of the miocene all the north of Africa had definitely emerged, and since that epoch the contour of the southern coast of the Mediterranean has not sensibly varied. Both M. Rolland and M. Pomel consider the quaternary formation of the Sahara as continental in origin, and deposited by diluvial waters in an age when the Sahara was abundantly supplied with rivers.

MINERALOGY.[1]

NEW MINERALS.—(1). *Aimafibrite*[2] (Igelström).—Among the manganese minerals of Nordmark, Sweden, are several new species, described by Igelström and others. Aimafibrite, so called from its blood-red color and fibrous structure, is a basic hydro-arseniate of protoxide of manganese with a little protoxide of iron, magnesia and lime. Its crystalline form is an orthorhombic prism, the crystals radiating from a point and forming globules. It occurs in globules about a centimeter in diameter, which are made up of radiating fibers. It is soluble in acid, gives water in

[1] Edited by Professor H. CARVILL LEWIS, Academy of Natural Sciences, Philadelphia, to whom communications, papers for review, etc., should be sent.

[2] Bull. Soc. Min. de France, VII, 1884, p. 121.